Meeting Minutes
Plutonium Finishing Plant (PFP)
Project Managers Meeting
MO250/200West
March 17, 2015

Date: May 12, 2015

Project Manager Representative, DOE-RL

Date: May 12, 2015

Project Manager Representative, Ecology

Administrative Record	**H6-08**
JB Borghese, CHPRC	**H8-43**
TE Bratvold, CHPRC	**T5-60**
BJ Dixon, CHPRC	**T5-60**
BL Foley, RL	**A6-38**
GR Konzek, RL	**A6-38**
SM Mortensen, Ecology	**H0-57**
RR Skinnarland, Ecology	**H0-57**

Participants: Tom Teynor, Glenn R. Konzek, Rick Bond, Heather John, Dieter Bohrmann, Tom Bratvold, Dale McKenney, Jane Borghese, Bill Cox, Jim Leary, Ted Hopkins

I. The Minutes from the previous meeting were approved.

II. Project Status was provided by CHPRC and DOE-RL

A. The PFP D4 Waterfall Schedule and status update was provided by Tom Bratvold.

- All glove boxes in 234-5Z have been isolated from the E-4 exhaust system and readied for demolition, though two gloveboxes will require in-situ size reduction due to their high Plutonium hold-up values.
- 236-Z: Pencil tanks 8 and 9 are complete. There is one remaining pencil tank assembly left to go. Size reduction activities are scheduled to start in a few weeks. Completing the pencil tanks will create space for bulk area cleanout. Cleanout of the floor area will allow the floor to be sampled. Once this is complete, Savannah River personnel using a "gamma camera" will identify hot spots requiring remediation on the walls. To support remediation efforts, approximately 4" of grout will be poured over the floor to create a clean work area from which to decontaminate and sample the walls.
- 242-Z: Completed isolation and size reduction of WT-3 Glove box. WT-2 is nearly complete as well. WT-1 is in demolition preparation and should be completed this month. WT-1 and WT-2 are connected and are highly contaminated. Tank Room: New NDA results show that the tanks can go to PermaFix NW for size reduction or can be packaged directly for WIPP shipment. Levels are within the radioactive material license of the facility. They will not have to be size reduced to meet material quantity limits for shipment.
- 243-Z—Preparation for demolition activities are underway.

B. Capital asset project status was discussed. (DOE requires CD 2/3 decision internally.)

C. Important demolition activities/accomplishments since January 2015:

- DSA Revision 12 was submitted to RL on January 8, 2015, and comment resolution is in process. The completion date is currently projected to be late March to early April.
- New Non-destructive Analysis (NDA) equipment that uses high purity germanium detectors will be used to help minimize manual modeling, and improve the accuracy of the NDA values.
- Discovery of resin beads within respirators resulted in a Stop Work that impacted activities in 236-Z and 242-Z. PFP is getting close to a final resolution of the issue. QA/QC audits of the contractor and changes in their operations are generating good results. PFP will continue to survey/inspect the respirators to ensure quality and an independent review for QA/QC will be performed.
- The bulk area cleanout in RMC process line was completed.
- Based on new NDA values, it has been determined that glove box HC-18M can be removed whole during demolition.
- Planning for in-situ size reduction of HC-9B glove box is underway. The team is in training and this glovebox within the C-Line will be their first in-situ size reduction job.
- Removed 262 feet of E4 ducting.
- Applied fixative to 1339 feet of E4 ducting.

- 236-Z characterization will be enhanced through use of the Savannah River site gamma camera. Work is currently projected to begin the end of May.
- Waste Disposition since January 2015:
  - Glove boxes removed to-date 94% complete.
  - Shipped Pencil Tanks 21/22, 43, 44 and 50 (5 Pencil Tank Assemblies remain out of 41).

D. 243-Z Water Discharge Re-route to French Drains (Glenn Konzek)
Preliminary Modeling Evaluation of Impact to Groundwater for Proposed Liquid Discharge to 216-Z-13 and 216-Z-14 French Drains (author: Will Nichols) Disposition of liquid effluents currently being treated in 243-Z was discussed. Tom Teynor requested the groundwater technical paper regarding discharge to the French drains, "Preliminary Assessment of Proposed Discharges to 216-Z-13 and 216-Z-14 French Drains" be added to the minutes of this meeting. Rick Bond concurred. CHPRC is in discussion with EPA regarding the 200W Pump and Treat facility taking the cooling water. Rick Bond (Ecology) pointed out that Ecology is looking for the easiest way to transport the waters from PFP. Tom Bratvold said the CHPRC was conducting an estimate for the cost associated with setting up a tank, sump, transfer line/pump and trucking the water to 200W Pump and Treat. Modifications to 200W Pump and Treat to allow it to take tanker loads would also be required.

III. Milestone Status

M-083-44 Complete transition of the 234-5Z (Plutonium Conversion Facility) & ZA (Plutonium Conversion Support Facility), 243-Z Low level Waste Treatment Facility, 291-Z Exhaust Building, and 291-Z-1 exhaust stack to support PFP decommissioning.

- At risk; due date September 30, 2015
- Realign definition of transition to incorporate DSA Rev 12 modifications.
- Ready for demolition sequence
- Deactivate and prepare for dismantlement the above grade portions of the 234-5Z & ZA, 243-Z, and 291-Z and 291-Z-1 Stack buildings.
- 243-Z is now tentatively scheduled for demolition in June 2015 (re-scheduled from March 2015 planned start reported in the previous PMM.

M-083-24-T01 Submit Revision 0 of the PFP Complex Surveillance and Maintenance (S&M) Plan to Ecology.

- On schedule, Due Date: 6/30/2016
- Draft completed
- On hold pending clarification of end state criteria.

M-083-00A Complete PFP Facility transition & selected disposition activities. Completion of this major milestone includes the following key elements: 1) completion of all activities necessary to achieve end point criteria established through Milestone M-83-20 for placing the PFP facility in a safe and stable S&M mode, 2) completion of all activities described in the approved M-83 series interim milestones and target date; and 3) completion of the balance of PFP selected disposition activities pursuant to the final action memoranda and work plans. Also see "description/justification" contained in change form M-83-01-03.

- At Risk, Due Date 9/30/2016
- Redefining transition to align with DSA Revision 12 modification.

IV. Project Issues, Concerns, and Challenges

A. Duct Level - There is over a mile of E4 duct and another mile of 26 inch vacuum line left to remove. They may be a critical path to the project.
B. Air Dispersion Model – Modeling using current assumptions will start at the end of March with an initial evaluation available by the end of May.
C. Canyon Floor - Sequence of operations: Remove the pencil tanks, bulk cleanout of area, decontaminate/wipe down pans and then characterize the floor. Once characterization is complete, further discussions for demolition preparation will ensue.
D. In-situ glove box size reduction - This is extremely hazardous work to size reduce plutonium contaminated glove boxes, pencil tanks, and piping into WIPP compliant packaging.
E. DSA revision 12 review, approval and implementation - Current revision, Revision 11 does not support D4 operations. Revision 12 will provide coverage (hazards analysis/controls) for demolition. DSA Rev. 12 is very important to the completion of PFP and includes hazard analysis for completing work. Comment resolution on Rev 12 is expected to be completed in late March to early April.

V. Other Topics

A. Schedule Risk/ Evaluation by Project Managers - Project Managers use a risk matrix which estimates the probability of occurrence of risks and gains by running a series of Monte Carlo simulations that results in a curve from which we can use standard deviation to estimate confidence in the schedule. This process helps the PM to identify strengths, opportunities, weakness and risk.

VI. Ecology Topics to be Covered (Ecology)

A. The Parties discussed the 110 day notification if M-083-44 is to be missed.
B. Ecology is planning PFP work for the next two years (July 1, 2015 through June 30, 2017).
C. Rick Bond asked about Department of Health issues. Tom Bratvold stated that he was not aware of any DOH air issues at PFP. When the PFP Air Dispersion Model is complete, DOH will be involved regarding the location/ relocation of monitors.

VII. General Discussion

A. Meeting Summary; Review and Document Agreements and Actions; New Issues or Concerns:

VIII. Next Meeting Date and Location

A. The next meeting will be in May at PFP or Federal Building. Ecology representatives will be Ron Skinnarland and Seana Mortensen.

IX. Walk down

Walk down included C-Line Control Room, 243-Z pre-demolition site and a 360° walk around of the facility. Glenn Konzek acted as the tour guide and presented information on the site. Rick Bond, Heather John and Dieter Bohrman from Ecology attended. This is Mr. Bond's last walk down of PFP as he is retiring. No successor has been identified. Mr. Ron Skinnarland will be acting Ecology lead until a formal decision is made.

Attachments: "Preliminary Assessment of Proposed Discharges to 216-Z-13 and 216-Z-14 French Drains"

ECF-200ZP1-15-0005
Revision 0

Modeling Evaluation of Impact to Groundwater for Proposed Liquid Discharge to 216-Z-13 and 216-Z-14 French Drains

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
under Contract DE-AC06-08RL14788

CH2MHILL
Plateau Remediation Company
P.O. Box 1600
Richland, Washington 99352

ECF-200ZP1-15-0005
Revision 0

Modeling Evaluation of Impact to Groundwater for Proposed Liquid Discharge to 216-Z-13 and 216-Z-14 French Drains

Document Type: ENV Program/Project: EP&SP

W. E. Nichols
CH2M HILL Plateau Remediation Company

Date Published
February 2015

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
under Contract DE-AC06-08RL14788

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Plateau Remediation Company
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Richland, Washington 99352

APPROVED
By Ashley R Jenkins at 9:55 am, Mar 09, 2015

Release Approval Date

Approved for Public Release;
Further Dissemination Unlimited

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ENVIRONMENTAL CALCULATION COVER PAGE

Section 1: Completed by the Responsible Manager

Project:

Date: 02/26/2015

Calculation Title & Description: Modeling Evaluation of Impact to Groundwater for Proposed Liquid Discharge to 216-Z-13 and 216-Z-14 French Drains

RELEASE / ISSUE

DATE: Mar 09, 2015 HANFORD RELEASE

Section 2: Completed by Preparer

Calculation No.: ECF-200ZP1-15-0005 **Revision No.:** 0

Revision History

Revision No.	Description	Date	Affected Pages ADD ROW
0	Initial issue	02/26/2015	All
			X

Section 3: Completed by the Responsible Manager

Document Control:

Is the document intended to be controlled within the Document Management Control System (DMCS)? ☒ Yes ☐ No

Does document contain scientific and technical information intended for public use? ☒ Yes ☐ No

Does document contain controlled-use information? ☐ Yes ☒ No

Section 4: Document Review & Approval

	(Name /Position)	Signature	Date
Preparer:	WE Nichols Modeler Team Leader (CHPRC)		27 FEB 2015
Checker:	N Hasan Modeler (INTERA, Inc.)		27 FEB 2015
Senior Reviewer:	J Jayne Senior Modeler (INTERA, Inc.)		03 MAR 2015
Responsible Manager:	AH Aly Risk & Model Integration Manager (CHPRC)		3/4/15

Section 5: Applicable if calculation is a risk assessment or uses an environmental model

PRIOR TO INITIATING MODELING:

Required training for modelers completed:

	(Name /Position)	Signature	Date
Integration Lead	WE Nichols Modeler Team Leader (CHPRC)		19 FEB 2015

ENVIRONMENTAL CALCULATION COVER PAGE (CONTINUED)

Section 4: Document Review & Approval			
Safety Software Approved:			
WE Nichols Modeler Team Leader (CHPRC) **Integration Lead**	(Name /Position)	Signature	19 FEB 2015 Date
CALCULATION APPROVED:			
AH Aly Risk & Model Integration Manager (CHPRC) **Risk/Modeling Integration Manager:**	(Name /Position)	Signature	3/4/15 Date

Contents

Figures

Terms

CHPRC	CH2M HILL Plateau Remediation Company
ECF	environmental calculation file
PFP	Plutonium Finishing Plant
STOMP	Subsurface Transport Over Multiple Phases (software)
TC&WM EIS	Tank Closure and Waste Management Environmental Impact Statement

Environmental Calculation File

Modeling Evaluation of Impact to Groundwater for Proposed Liquid Discharge to 216-Z-13 and 216-Z-14 French Drains

1 Purpose

This environmental calculation file (ECF) documents modeling calculation evaluates the potential for proposed discharges to the Plutonium Finishing Plant (PFP) French drains 216-Z-13 and 216-Z-14 of effluent with above-standard concentrations of contaminants to adversely impact groundwater.

2 Background

In compliance with the RAWP, the Ground Water Discharge Permit ST0004511, and DOE/RL-97-67 Revision 6, waste water discharges from 291-Z from the Evaporative Cooler, Steam Turbine Cooling Water and Steam Turbine Condensate Water are authorized for discharge to French Drains adjacent to 243-Z (Figure 1).

PFP is preparing to demolish the 243-Z Low-Level Waste Treatment Facility. This will impact the ability of PFP to transfer water from the 291-Z Exhaust Air Filter Stack Building to the 243-Z for treatment and subsequent disposal at TEDF.

The 243-Z is scheduled to commence demolition on May 28, 2015. To facilitate demolition actions, the 243-Z will need to be offline (utility isolated) by March 19, 2015.

Waste water currently sent through the utility system for disposal at an approved liquid disposal facility will be rerouted for disposal to two French drains in close proximity to 243-Z: 216-Z-14 (currently in use) and 216-Z-13 (currently not in use).

These French drains consist of a two part drain system. The covered top of the upper French drain is visible on the surface. The lower French drain (Figure 2) is constructed of two tile culverts placed end-to-end, and backfilled beneath 9 feet (2.7 meters) of gravel. Two pipes discharged to the lower French drain.

The estimated volume of discharge to the environment is approximately 101,856 gallons per year (total) distributed to these French drains.

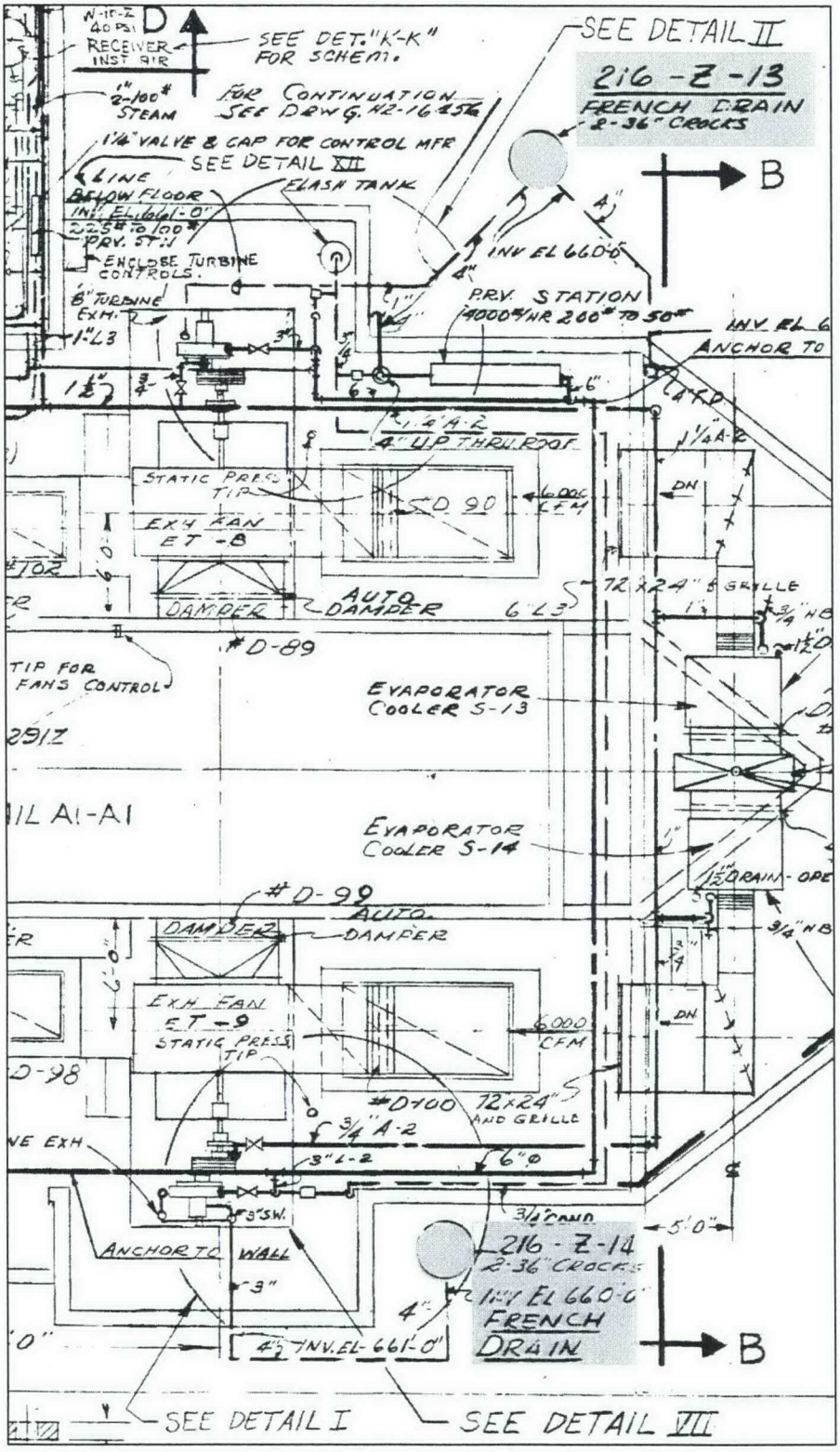

Figure 1. 200-ZP-13 and 200-ZP-14 French Drain Locations

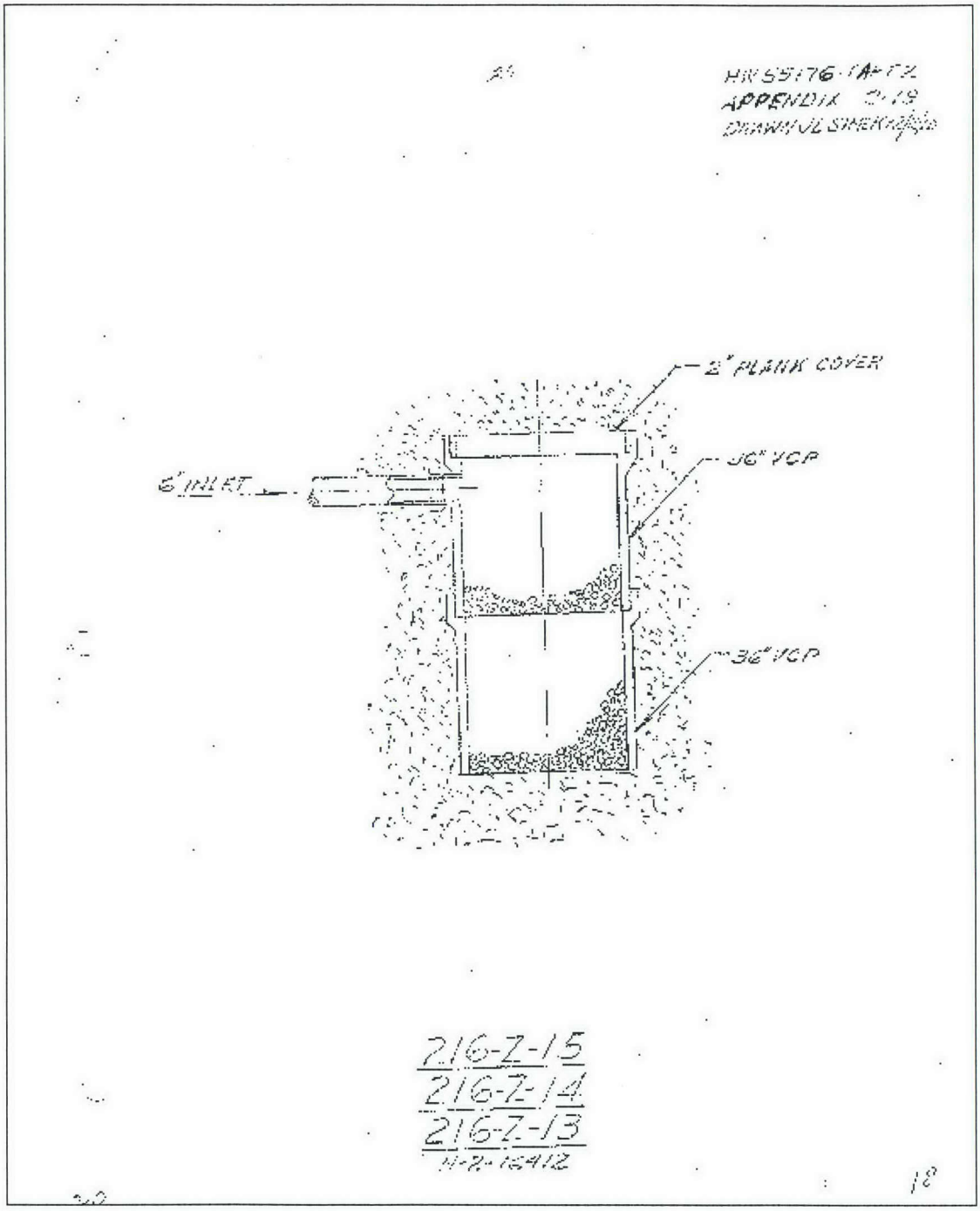

Figure 2. Construction of French Drains 216-Z-13 and 216-Z-14

3 Methodology

The models to be used are those prepared for the cumulative impacts evaluation of the Tank Closure and Waste Management Environmental Impact Statement (TC&WM EIS) (DOE/EIS-0393), available from the Environmental Model Management Archive (EMMA) at this location:

/EMMA/CHPRC/Models/TC&WM-EIS-Models/vadose-flow-transport/cumulative/Z Area

Subdirectories /216-Z-13_FrenchDrain & /216-Z-14_FrenchDrain

The methodology follows these steps:

1. Obtain TC&WM EIS Subsurface Transport Over Multiple Phases (STOMP) models from configuration controlled versions of these models available in the EMMA for the cumulative impacts models for sites 216-Z-13 and 216-Z-14; for transport, select the lead (Pb) input file
2. Modify the flow solution input files as follows:
    a. Change the ~Simulation Title card to indicate user, company, and date for this simulation
    b. Change the ~Mechanical Properties card to force the "Pore Compressibility" treatment that was the default in the version of STOMP used for the TC&WM EIS (this treatment changed starting in STOMP CHPRC Build 4)
3. Simulate flow until 1944 to attain steady state initial conditions using the modified STOMP input files in a /flow sub-directory to establish initial hydraulic conditions; copy the resulting 'restart' file to an adjacent /transport sub-directory.
4. Modify the lead (Pb) transport input file to treat lead as a non-sorbing, non-decaying tracer of unit source as follows:
    a. Change the ~Simulation Title card to indicate user, company, and date for this simulation
    b. Change the ~Mechanical Properties card to force the "Pore Compressibility" treatment that was the default in the version of STOMP used for the TC&WM EIS (this treatment changed starting in STOMP CHPRC Build 4)
    c. Change the ~Solute/Porous Media Interaction Card to set the contaminant sorption (K_d) values to zero to represent a non-sorbing tracer
    d. Modify the ~Source card to accomplish the following:
        i. Omit past sources of lead solute mass source (but leave the liquid volumetric source for the past to maintain the hydraulic representation)
        ii. Add an aqueous volumetric source strength to represent the proposed discharge rate (in gallons per year) for a two-year period commencing March 19, 2015
        iii. Add a contaminant source strength of unit concentration (1/gal) for the same two-year period commencing March 19, 2015
    e. Modify the ~Surface Flux card to change the units for aqueous volumetric flux output to gallons-per-year to simplify output post-processing
5. Simulate transport from 1944 for 10,000 years using the modified STOMP transport input files in the /transport sub-directory

6. Process the resulting 'surface' file using the surfaceTo.pl Perl script to format the surface flux results for input to the Igor Pro®[1] graphics software

7. Use the Igor® graphics software to import the surface flux results; create a data wave that is a function of the mass release flux for release area 1 (the plane at the water table directly below the injection source nodes) divided by the aqueous volumetric flux for release area 1; adjust the time scale by adding 1944 years to the time variable; plot results to display the relative concentration with calendar year

The source introduced in Steps 4.d.ii and 4.d.iii above will introduce the proposed liquid discharge to the model for the period March 19, 2015 until March 19, 2017. The source is introduced to the model by specifying a constant aqueous volumetric source rate of 52,928 gallons per year to each French drain model at the source location (a single node) already specified in the model to represent the injection point. The solute mass is introduced to the model in the same node such that the one unit of solute mass is injected per gallon of water, in order that the concentration of the discharge water has a unit concentration (1 unit of mass per gallon of water).

The source node in this model representing the French node has rectangular dimensions of 0.81 m by 0.81 m horizontally, by 2 m vertically. Accordingly, the source is uniformly applied over this single node.

4 Assumptions and Inputs

Primary input is the aqueous discharge proposed for release through the French drains 216-Z-13 and 216-Z-14. The quantity proposed is a total of 101,856 gallons per year, assumed to be divided equally between the two French drains for a rate of 50,928 gallons per year each. This discharge rate will be maintained for two years, commencing March 19, 2015, based on information provided in the request for this model evaluation. The discharge rate is assumed uniform during this period.

The source start time will be expressed in STOMP in seconds elapsed since the simulation start time (midnight at start of January 1, 1944-March 19, 2015), or simulation time 2.2472640E+09 seconds. It will end two years later, on March 19, 2017, or simulation time 2.3104224E+09 seconds.

STOMP input files were prepared as indicated in Section 3. The changes imposed on the base TC&WM EIS STOMP inputs are clearly identified using comment fields commencing and ending with "# PFP Mod" for clarity and traceability purposes.

5 Software Applications

STOMP was the primary software used for this calculation. Igor Pro®, a commercial graphics software package, was used to for graphical display of results.

5.1 Approved Software

STOMP (PNNL-12030, 2000, *STOMP Subsurface Transport Over Multiple Phases Version 2.0 Theory Guide*; PNNL-15782, 2006, STOMP Subsurface Transport Over Multiple Phases Version 4.0 User's Guide; PNNL-11216, *STOMP Subsurface Transport Over Multiple Phases: Application Guide*) was the

[1] Igor Pro is a registered trademark of Wavemetrics, Lake Oswego, Oregon.

software used for this calculation; as approved software, the information required is provided in this section.

5.1.1 Description

The vadose zone fate and transport calculations are performed using CHPRC Build 4 of the STOMP software, registered in the Hanford Information System Inventory (HISI) under identification number 2471. STOMP use by CHPRC is managed under the following software lifecycle documents: CHPRC-00222, *STOMP Functional Requirements Document*; CHPRC-00176, *STOMP Software Management Plan*; CHPRC-00211, *STOMP Software Test Plan*; CHPRC-00515, *STOMP Acceptance Test Report*; and CHPRC-00269, *STOMP Requirements Traceability Matrix*.

- Software Title: STOMP
- Software Version: CHPRC Build 4
- HISI Identification Number: 2471
- Workstation type and property number (from which software is run): STOMP was executed on the Tellus Subsurface Modeling Platform, a Linux® cluster owned by CHPRC and managed by Mission Support Alliance. The simulations were run on compute nodes c0-0 and c0-1. As given by the command "uname -a", the operating system details for these compute nodes are:

```
Linux compute-0-0.local 2.6.18-308.4.1.el5 #1 SMP Tue Apr 17
17:08:00 EDT 2012 x86_64 x86_64 x86_64 GNU/Linux

Linux compute-0-1.local 2.6.18-308.4.1.el5 #1 SMP Tue Apr 17
17:08:00 EDT 2012 x86_64 x86_64 x86_64 GNU/Linux
```

5.1.2 Software Installation and Checkout

A copy of the Software Installation and Checkout Form for the STOMP installation used for this calculation is provided in Attachment E to this ECF.

5.1.3 Statement of Valid Software Application

- DOE/RL-2011-50 contains a summary of the main model attributes and code selection criteria that serve as the basis for the demonstration of the adequacy of the STOMP code for use in vadose zone modeling at Hanford. The results of the evaluation in DOE/RL-2011-50 show that the STOMP code is capable of meeting or exceeding the identified attributes and criteria. The comparison of the code selection criteria to the STOMP code capabilities indicates the STOMP code is capable of simulating all of the necessary FEPs, and that STOMP meets all of the other required code selection criteria. Section 6.4.1 of DOE/RL-2011-50 addresses code selection criteria, including quality assurance documentation of verification studies for specific model attributes (e.g., unsaturated flow, solute transport, infiltration, and drainage), and includes a discussion of other code related criteria (i.e., inter-code comparisons, hardware requirements, solution methodology, dimensionality, and output capability).
- The results of CHPRC acceptance testing (CHPRC-00515) demonstrate that the STOMP software is acceptable for its intended use by the CHPRC. Installations of the software are operating correctly, as demonstrated by the Tellus Linux® Cluster system producing the same results as those presented for selected problems from the STOMP application guide (PNNL-11216) in accordance with the software test plan (CHPRC-00211).

6 Calculation

The STOMP executable file 'stomp-w-bcg-chprc04l.x' (STOMP, water operational model, bi-congugate gradient solver, CHPRC Build 4, Lahey optimized compilation),which is installed and tested on the Tellus cluster, was invoked to simulate the flow and transport using the input files prepared following the methodology outlined in Section 3. The simulations ran without incident. Results in the 'surface' output files for the transport runs were post-processed using the surfaceTo.pl Perl script, and then prepared in Igor Pro® for graphical presentation.

All model files (input and output) are preserved in the EMMA archive at this location:

/EMMA/CHPRC/Application/ECF-200ZP1-15-0005/rev.0

7 Results/Conclusions

Figure 3 displays the relative concentration of vadose zone aqueous phase liquid arriving at the water table over time for the 216-Z-13 French drain. The relative concentration represents the reduction in the source concentration injected into the French drain over a two-year period; thus, in Figure 1 the predicted peak relative concentration is 0.075 in calendar year 2844, so the concentration at the source is reduced by a factor slightly greater than 13 for a conservative, non-retarded contaminant. If the contaminant were subject to decay or retardation, the result would be a greater reduction and a later peak arrival time.

Similarly, Figure 4 displays the relative concentration of vadose zone aqueous phase liquid arriving at the water table over time for the 216-Z-14 French drain. Again, the relative concentration represents the reduction in the source concentration injected into the French drain over a two-year period; thus, in Figure 2 the predicted peak relative concentration is 0.110 in calendar year 3076, so the concentration at the source is reduced by a factor slightly greater than 9 for a conservative, non-retarded contaminant. If the contaminant were subject to decay or retardation, the result would be a greater reduction and a later peak arrival time.

These results do not reflect the impact of past contamination discharged through these French drains, but do reflect the hydraulic impact of past discharges of liquid because the aqueous source applied in the TC&WM EIS models were retained in the simulation. Thus, the results provided are indicative of the bounding impact on groundwater of the contaminant mass for contamination in the proposed new effluent discharge to these French drains.

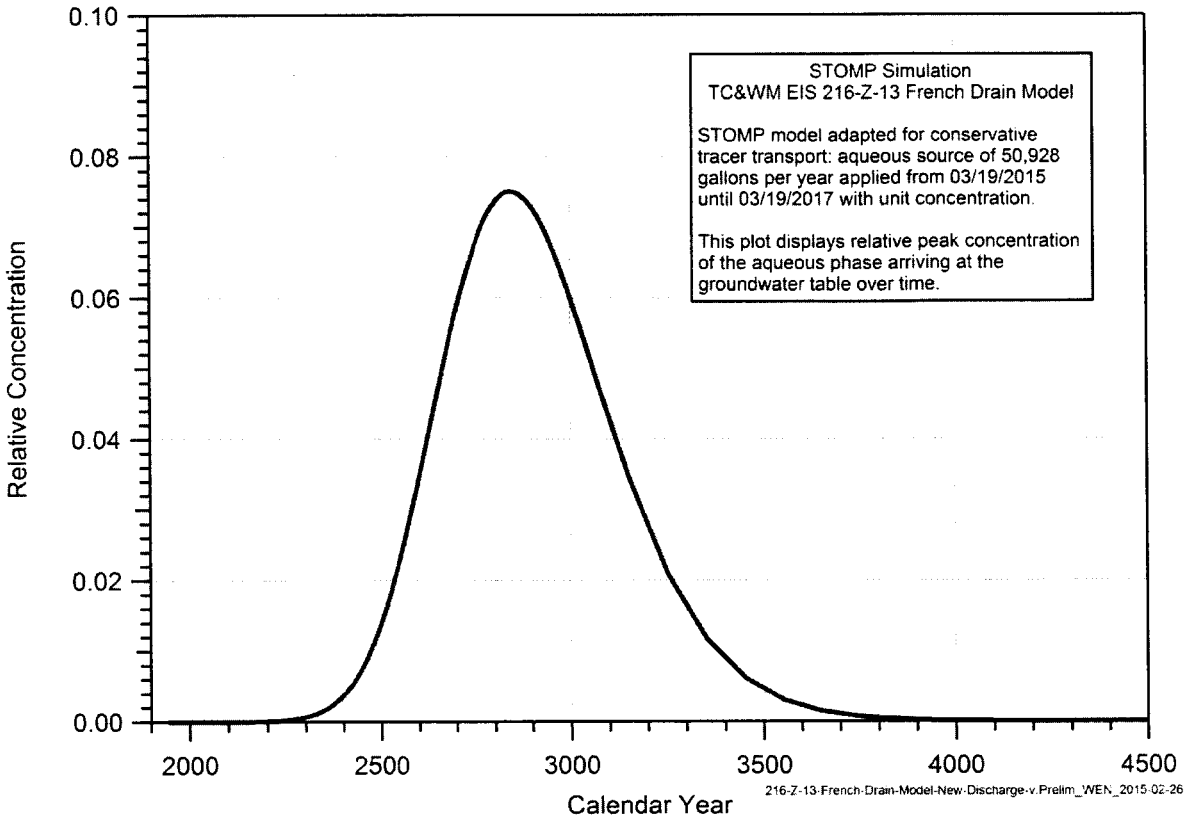

Figure 3. Relative Concentration of Aqueous Phase Liquid Arriving at Water Table over Time from 216-Z-13 French Drain for Two-Year Source of 50,928 gallons per year of Unit Concentration(1/gal), Applied Starting March 19, 2015

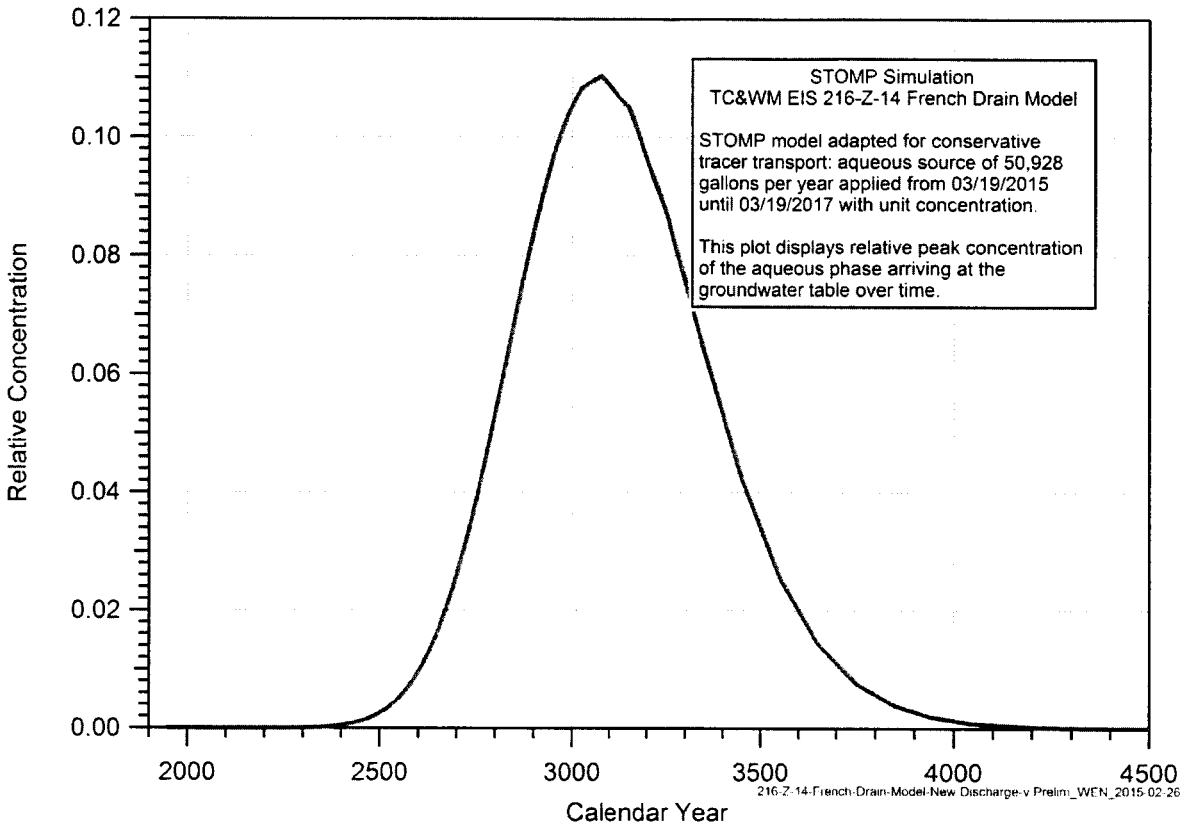

Figure 4. Relative Concentration of Aqueous Phase Liquid Arriving at Water Table over Time from 216-Z-14 French Drain for Two-Year Source of 50.928 gallons per year of Unit Concentration(1/gal), Applied Starting March 19, 2015

8 References

CHPRC-00176, 2011, *STOMP Software Management Plan*, Rev. 2, CH2M Hill Plateau Remediation Company, Richland, Washington.

CHPRC-00211, 2014, *STOMP Software Test Plan*, Rev. 2, CH2M Hill Plateau Remediation Company, Richland, Washington.

CHPRC-00222, 2011, *STOMP Functional Requirements Document*, Rev. 1, CH2M Hill Plateau Remediation Company, Richland, Washington.

CHPRC-00269, 2013, *STOMP Requirements Traceability Matrix (CHPRC Build 4)*, Rev. 3, CH2M Hill Plateau Remediation Company, Richland, Washington.

CHPRC-00515, 2013, *STOMP Acceptance Test Report (CHPRC Build 4)*, Rev. 3, CH2M Hill Plateau Remediation Company, Richland, Washington.

DOE/EIS-0391, 2012, *Final Tank Closure and Waste Management Environmental Impact Statement for the Hanford Site, Richland, Washington*, U.S. Department of Energy, Office of River Protection, Richland, Washington. Available at: http://energy.gov/nepa/downloads/eis-0391-final-environmental-impact-statement.

DOE/RL-2011-50, 2012, *Regulatory Basis and Implementation of a Graded Approach to Evaluation of Groundwater Protection*, Rev. 1, U.S. Department of Energy, Richland Operations Office, Richland, Washington. Available at: http://www5.hanford.gov/arpir/?content=findpage&AKey=0093361.

PNNL-11216, 1997, *STOMP Subsurface Transport Over Multiple Phases: Application Guide*, Pacific Northwest National Laboratory, Richland, Washington. Available at:

PNNL-12030, 2000, *STOMP Subsurface Transport Over Multiple Phases Version 2.0 Theory Guide*, Pacific Northwest National Laboratory, Richland, Washington. Available at:

PNNL-15782, 2006, *STOMP Subsurface Transport Over Multiple Phases Version 4.0 User's Guide*, Pacific Northwest National Laboratory, Richland, Washington. Available at:

Attachment A

STOMP Software and Installation Checkout Form for Tellus

CHPRC SOFTWARE INSTALLATION AND CHECKOUT FORM

Software Owner Instructions:

Complete Fields 1-13, then run test cases in Field 14. Compare test case results listed in Field 15 to corresponding Test Report outputs. If results are the same, sign and date Field 19. If not, resolve differences and repeat above steps.

Software Subject Matter Expert Instructions:

Assign test personnel. Approve the installation of the code by signing and dating Field 21, then maintain form as part of the software support documentation.

GENERAL INFORMATION:

1. Software Name: STOMP (Subsurface Transport Over Multiple Phases) Software Version No.: Bld 4

EXECUTABLE INFORMATION:

2. Executable Name (include path):

All executable files installed in directory /tellus_export/chprc/bin

MD5 File Signature	Executable File Name
6536b8e12d8c5b83dca76f2c947b6153	stomp-wae-bcg-chprc04i.x
e0cdf04bc1a2f6c5bc5a1b499939f663	stomp-wae-bcg-chprc04l.x
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3f837a0fb8d9f47dbcaaa686f542d7fc	stomp-wae-bd-chprc04l.x
7e5b4cc56a8991b3d5a8ea2ed15bce47	stomp-wae-cgsg-chprc04i.x
00a896c0c3ec068174857814adlc9ec46	stomp-wae-cgsg-chprc04l.x
f18ff5ab5667065d8ab126b7344fb6a0	stomp-wae-cgst-chprc04i.x
061af86cf21ad8435b046d0efabe971b	stomp-wae-cgst-chprc04l.x
3c811a9855dc0e430bf3c8a7abcf37e	stomp-w-bcg-chprc04i.x
20436d615a94955a2ce8eecdb8cba546	stomp-w-bcg-chprc04l.x
8b3df29df21d040189c3e2a50ef823bb	stomp-w-bd-chprc04i.x
066a289a75aedb973eb2536da5d7d1ff	stomp-w-bd-chprc04l.x
c8e62ad7a0d9b6fca39d8a8952ef5d8e	stomp-w-cgsg-chprc04i.x
28ad16806e1307aca51fd7bf89793e75	stomp-w-cgsg-chprc04l.x
6c25051016db2fe1f883a7caaaable97	stomp-w-cgst-chprc04i.x
ff9ff6f29b3469419ffaece87d7e772b	stomp-w-cgst-chprc04l.x
0c3e3fba40f5b93e71bcf9586432fd27	stomp-w-r-bcg-chprc04i.x
78492aee80a8c2d0a4e82aabf4a9c213	stomp-w-r-bcg-chprc04l.x
84b129786aba9c4be884e15e45a67389	stomp-w-r-bd-chprc04i.x
e990f1566c8099a8d54508dc3da9cd88	stomp-w-r-bd-chprc04l.x
18a589a2b55aab2db290efea19b39351	stomp-w-r-cgsg-chprc04i.x
6569959476772a137df35ce874821889	stomp-w-r-cgsg-chprc04l.x

3. Executable Size (bytes): MD5 signatures above uniquely identify each executable file

COMPILATION INFORMATION:

4. Hardware System (i.e., property number or ID):

Tellus Subsurface Modeling Platform

5. Operating System (include version number):

Linux tellusmgmt.rl.gov 2.6.18-308.4.1.el5 #1 SMP Tue Apr 17 17:08:00 EDT 2012 x86_64 x86_64 x86_64 GNU/Linux

INSTALLATION AND CHECKOUT INFORMATION:

6. Hardware System (i.e., property number or ID):

Tellus Subsurface Modeling Platform

7. Operating System (include version number):

Linux tellusmgmt.rl.gov 2.6.18-308.4.1.el5 #1 SMP Tue Apr 17 17:08:00 EDT 2012 x86_64 x86_64 x86_64 x86_64 GNU/Linux

CHPRC SOFTWARE INSTALLATION AND CHECKOUT FORM (continued)

1. Software Name: STOMP (Subsurface Transport Over Multiple Phases) Software Version No.: Bld 4

8. Open Problem Report? (●) No ( ) Yes PR/CR No.

TEST CASE INFORMATION:

9. Directory/Path:

10. Procedure(s):

CHPRC-00211 Rev 1, STOMP Software Test Plan

11. Libraries:

N/A (static linking)

12. Input Files:

Input files for ATC-STOMP-1, ATC-STOMP-2, and ATC-STOMP-2

13. Output Files:

plot.* files produced by STOMP in testing

14. Test Cases:

ATC-STOMP-1, ATC-STOMP-2, and ATC-STOMP-3

15. Test Case Results:

Pass for all executables identified above (two failed executables are documented in the Requirements Traceability Matrix and are not included in the installation).

16. Test Performed By: WJ McMahon

17. Test Results: (●) Satisfactory, Accepted for Use ( ) Unsatisfactory

18. Disposition (include HISI update):

Accepted; Installation noted in HISI for users WE Nichols, TJ Budge, WJ McMahon, S Mehta.

Prepared By:

19.			
Software Owner (Signature)	Print	Date
	WE Nichols	24 APR 2013

20. Test Personnel:

Sign	Print	Date
	WJ McMahon	06 May 2013

Approved By:

21.		
Software SME (Signature)	Print	Date
	N/R (per CHPRC-00211 Rev 1)	